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Cases of accessory pancreas as well as anomalies in the form and position of the gland are, according to the chief authorities, not very uncommon, though the literature on the subject is very meagre. The case here described is, however, the first which has come under our notice and we have thought it worthy of a few remarks, particularly as the condition has a pathological significance which has not been brought into much prominence. That cases are not often recorded is probably due to the fact that the pancreas and its vicinity are not always examined with the care that they ought to be.

This condition of accessory pancreas was found at a postmortem at the Royal Victoria Hospital, performed upon a young boy suffering from tuberculous caries of the lumbar vertebræ. The details of the case, however, have no special interest in the present connection, as the pancreatic condition was merely a side issue found unexpectedly at the autopsy.

The stomach was of fair size, containing a small amount of yellowish fluid; the pylorus admitted one finger; the mucosa was normal; there was no abnormality in shape or position.

The duodenum was of normal size and in the normal position ; its mucosa was normal.

Just at the point where the duodenum pierced the peritoneal covering to form the jejunum, was a small flat nodule. This was situated on the left lateral border of the gut on the same side as the pancreas. The nodule was roughly oval in shape, measuring 1.5 c.m. long by 1 c.m. across and elevated about 5 c.m. above the general level of the serosa. Its margin gradually sloped on all sides so that the nodule was of the shape of a flattened dome. The serous covering invested it closely and it had no connection in any way with the main pancreas, which was in its normal site and of normal appearance. Section through the nodule showed that it was made up of a series of small nodules which had all the appearance of pancreatic tissue. The orifice of the excretory duct could not be found, although a subsequent examination showed that the duct must have existed.

Microscopical Examination.—A section was made directly through the middle of the nodule well into the intestinal tissue at each end. Owing to the difficulty of cutting it, it was not possible to preserve the

intestinal mucosa intact throughout its length, but a considerable portion was present at each end of the section, so that it was easy to make out the relationship of the parts.

The tumour formed was a distinct nodular excrescence in the wall of the duodenum, or rather at the very beginning of the jejunum, projecting mainly outwards, though to a lesser degree into the lumen of the bowel. The serosa was directly continuous over this.

The tumour proper was found to consist of multiple lobules of varying size provided with ducts and having the acinous structure of the pancreatic gland. On the margin of this next the lumen, the mucous membrane of the duodenum was found to be continuous over the surface, the muscularis mucosæ being also unbroken. The intestinal mucosa showed some reduplication with the normal villi. There were no signs of any inflammation or other abnormality except the slight soddenness and smeariness so often seen in the intestinal mucosa and due to post-mortem changes. The crypts were normal; Brunner's glands were not seen, unless certain atrophied, tube-like collections of cells were the remains of such. The tumour was regarded as being situated at the very commencement of the jejunum below the muscularis mucosæ and between it and the serosa.

At the one end of the nodule there was a distinct tendency for its substance to be separated into two portions, one being situated in the submucosa, and the other among the muscular bands of the intestinal wall. This tendency for separation did not, however, persist for long and towards the centre both parts became indistinguishably fused. Just at the margin of the outermost, the muscular coat bifurcated to enclose it, the inner portion running for a little distance in a fibrous septum into the substance of the tumour mass and eventually being lost, the outer being continued as a few thin fibres outside the tumour altogether but very soon disappearing.

Continuing the survey of the outermost portion of the section, the serous coat was found to be continuous over the whole mass, being slightly thickened in places. It sent inwards rather large fibrous septa between the lobules, which in places had a distinctly atrophied appearance. The condition of fibrosis was, however, more relative than actual. In several of these septa large isolated masses of unstriped muscle could be found, presumably the relics of the original muscular coat. These were quite separate and dissociated from the normally constituted muscularis.

Coming to the tumour itself, it had the structure of a compound racemose gland which was divided into well marked lobules bounded by fibrous septa, in which ran ducts and vessels. The lobules were in turn made up of acini, composed of a basement membrane lined with some-

what pyramidal cells. The lobules nearest the lumen of the intestine were large and well developed, only showing a moderate amount of self-digestion. The lobules just beneath the serosa were, however, smaller, the fibrous septa much larger, and the acini in many cases small and reduced by fibrous bands to small collections of cells in some cases irregularly massed together and in others presenting the circular arrangement of the proper acini. In many instances the nuclei only could be made out. One of the lobules so affected was practically only a tree-like arrangement of relatively large ducts with a very few badly formed acini about it. The ducts were everywhere relatively large, lined by columnar cells, and in places varicose-looking. Most of them were free from secretion and presented a normal appearance, while in some others there were a few mononuclear cells but no evidence of catarrh or obstruction. Some of the ducts seen in cross section were surrounded by a ring-like sheath of fibrous tissue. There was no inflammation about the ducts. The interlobular septa were composed in the main of well formed fibrous tissue. With the high power, could be seen a few oat-shaped and bluntly spindle mononucleated cells, presumably young connective tissue cells, together with a few round, deeply-staining mononuclear cells resembling lymphoid tissue. A striking feature was, however, the presence of rather large masses of unstriated muscle, well-defined and apparently isolated. Sometimes these occupied the largest portion of a septum. Even in the deeper portions of a gland, numerous fibres of unstriated muscle were to be readily made out, showing especially well by the Van-Gieson method of staining. These formed small wavy bands following the general course of the septa. None of the cell masses of Langerhans were noted, perhaps on account of the direction in which the sections were cut.

From a study of the sections just described, the nodule present was clearly composed of pancreatic tissue and for the most part in a functioning condition. The presence of well-formed ducts and acini without any evidence of catarrh or surrounding inflammation or signs of obstruction, indicates that the gland was secreting and possessed a fairly free discharge. Examination of the intestine, however, had failed to reveal the main duct opening, probably on account of its minuteness.

The fibrous bands observed in the outermost portion of the pancreatic nodule might possibly indicate a fibrous hyperplasia with consecutive atrophy of the secreting structure, but considering that the structure was really a development from a misplaced embryonic 'rest,' it is more natural to think that the deficiency in the parenchyma was due to a developmental hypoplasia. The pancreatic growth seems to have started in the submucosa of the jejunum, that portion being the most advanced in structure; but there were no doubt developmental centres in the mus-

ularis, for the muscularis is not merely displaced and atrophied from pressure, but muscle cells are found all through the central and outermost portion of the pancreatic nodule, indicating a growth which had insinuated itself or infiltrated between the various muscle bands.

When we consider the embryological development of the alimentary tract and its accessories, the explanation of the anomaly is not far to seek. At one period in the history of the human embryo the tract has the form of a simple straight tube, recalling the condition present in certain adult fishes and amphibians. As development goes on, the body cavity increases in size much faster than the intestinal canal, so that the connective tissue uniting the dorsal and ventral aspects of the gut to the body wall becomes elongated, to form ultimately two ligaments, each composed of two serous layers united by connective tissue. These are the dorsal and ventral mesenteries.

During the fourth week of foetal life the various parts of the alimentary tract begin to be differentiated. The dorsal aspect of the tube towards the head begins to bulge backwards; this is the primitive stomach. The liver begins to develop in the form of a small diverticulum, which is produced on the ventral wall of the primitive tube just below a point corresponding to the future duodenum. Some time after, a similar pouch on the dorsal wall of the same portion indicates the future pancreas. The relative position of things is well shown in the accompanying figure taken from His.

The primitive pancreas grows into the dorsal mesentery just referred to, where it takes up the various connective tissue, vascular mechanism, and all other elements which go to form the interstitial substance. The stalk of the diverticulum becomes the eventual pancreatic duct. Although at first the duct enters the duodenum at the opposite side from the common bile duct, as development goes on the openings gradually approximate, until finally, in the normal adult, the two ducts discharge by a common opening.

A number of curious aberrations from the normal have been described. One of these is the formation of a *pancreas minus*, which is situated on the anterior wall of the duodenum. The duct may discharge in common with the duct of Wirsung or by a separate opening. Some pancreatic lobules can also be situated behind the superior mesenteric vessels. Somewhat more frequent is the occurrence of an accessory pancreas. This is situated in the upper intestinal tract and very rarely, as Nauwerck has pointed out (*Nebenpancreas, Beitr. v. Ziegler, XII, 1893*), in the lower bowel or the wall of the stomach. They vary in size from a lentil to a Windsor bean, and usually lie concealed in the wall of the bowel, but sometimes, as in the case recorded, project above the general surface of the serosa. They communicate with the cavity of the bowel

by a duct. When in the jejunum they have been found in the apex of a diverticulum.

The explanation of the case here recorded is simple enough. In the process of the growth of the primary pancreatic diverticulum, some of the primitive germ cells have been separated from the others and have undergone a certain amount of development. As the intestine becomes larger and longer in the course of the embryo's growth, these aberrant cells became further separated from the main mass. As it was provided with a separate duct, the accessory may, and probably did, originate in a sort of side diverticulum from the main one. When the primitive diverticulum originated higher up in the digestive tract, we get the accessory pancreatic nodule in the wall of the stomach or else we get a well formed pancreas, its only abnormality being that its duct instead of opening into the duodenum discharges into the stomach. Such cases have been recorded.

The practical importance, from a pathological point of view, is that these misplaced pancreatic "rests," like other embryonic inclusions, are capable of independent growth, and thus may subsequently develop into tumours, either adenomata or carcinomata. Certain cancers of the stomach are thus not improbably due to these foetal implantations. The analogy is close with the suprarenal "rests" found in the kidney.

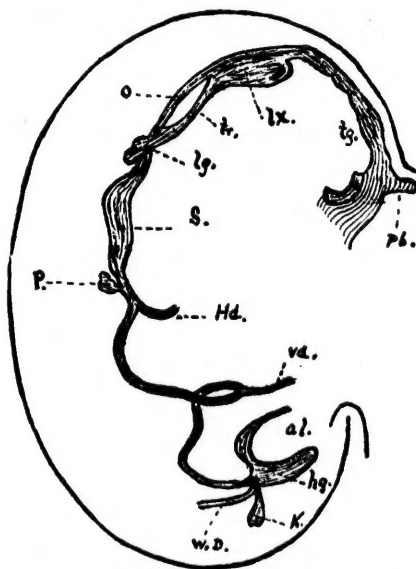


Fig. (After His.) Alimentary Canal of human embryo of twenty-eight days ; Pb, pituitary fossa ; tg, tongue ; lx, primitive larynx ; o, oesophagus ; tr, trachea ; lg, lung ; S, stomach ; P, pancreas ; hd, hepatic duct ; vd, vitelline duct ; al, allantois ; hg, hind-gut ; Wd, Wolffian duct ; k, kidney.